

## CLAIMS

1. A method of transmitting electric current to a furnace which is heated, either completely or partially, by electric current transported in the furnace wall (1), wherein said  
5 current is caused to be transmitted through devices (2-8) connected to or in abutment with said furnace wall, **characterised** by giving at least one of the devices (2-4) in the close proximity of the furnace wall (1) a section (10-12) that has a smaller cross-sectional area than the remaining part of the device (2-4) concerned; wherewith the current through said smaller cross-section (10-12) is caused to develop heat in the region of said smaller section  
10 (10-12) in a magnitude that will correspond essentially or totally to the heat magnitude (14) that would have been transported from the furnace wall (1) to a respective device (2-4) in the absence of said smaller cross-sectional area.
2. A method according to Claim 1, **characterised** by causing none or several of the  
15 devices (5-8) that lack such a section of smaller cross-sectional area also to carry current; and in that said none or several devices is/are dimensioned so that heat developed therein is caused essentially to correspond to the heat magnitude (14) that would have been transported from the furnace wall (1) to the devices (5-8) in the absence of said current in combination with the dimensioning of said devices.
- 20 3. A method according to Claim 1 or 2, **characterised** by causing the electrically conductive devices (2-8) in abutment with the furnace wall (1) to form electric current input devices, supports, measuring devices or other devices, or a combination thereof.
- 25 4. A method according to Claim 1, 2 or 3, **characterised** by causing the cross-sectional surfaces of the devices (2-8) in direct contact with the furnace wall to have mutually the same or mutually different square, circular shape or some other shape; and by giving the cross-sectional areas mutually the same or mutually a different size.
- 30 5. A method according to Claim 1, 2, 3 or 4, **characterised** by causing one or more of the devices (2-8) to be an electric current input device; and by causing one or more of said devices (2-8) to form a current drainage device, wherein the current is caused to flow through the furnace wall (1) by delivering said current through the device or devices

forming a current input device, and by discharging the current through the device or devices that function as current drainage devices.

6. A method according to Claim 1, 2, 3, 4 or 5, **characterised** in that those devices placed in the proximity of the volume of the furnace wall (1) where precision temperature control is desired are either a) provided with waists (2-4) of suitable dimensions for establishing an energy balance between the furnace wall and the current input device, or b) to cause these devices to be current carrying and dimensioned such that the current caused to flow through the device concerned will contribute to the development of heat that will establish an energy balance between the furnace wall and the current input device.

7. A method according to any one of the preceding Claims, **characterised** by producing the tube-like furnace from an FeCrAl material.

8. An arrangement for transmitting electric current to a furnace which is heated, either totally or partially, by current transported in the furnace wall (1), said current being transmitted through devices (2-8) located in abutment with the furnace wall, **characterised** in that at least one of the devices (2-4) has close to said furnace wall (1) a section (10-12) which has a smaller cross-sectional area than the remaining part of the device (2-4) concerned, wherein current passing through this smaller cross-section (10-12) causes in the region of said smaller cross-section (10-12) the development of heat in a magnitude that corresponds essentially or completely to the magnitude of the heat (14) that would otherwise have taken place from the furnace wall (1) to the device (2-4) in the absence of said smaller cross-sectional area.

9. An arrangement according to Claim 8, **characterised** in that none or several of the devices (5-8) that lack such a section of smaller cross-sectional area also is/are current carrying; and in that said none or several devices is/are dimensioned so that the heat generated therein will essentially correspond to the heat transportation (14) that would have taken place from the furnace wall (1) to the devices (5-8) in the absence of said current in combination with the dimensioning of said devices.

10. An arrangement according to Claim 8 or 9, **characterised** in that the electrically conductive devices (2-8) in abutment with the furnace wall (1) are current input devices, supports, measuring devices or other devices, or a mixture thereof.

5 11. An arrangement according to Claim 8, 9 or 10, **characterised** in that the cross-sectional surfaces of the devices (2-8) in direct contact with the furnace wall (1) have mutually the same or mutually different square, circular shapes or some other shape; and in that said cross-sectional surfaces have mutually the same or mutually different sizes.

10 12. An arrangement according to Claim 8, 9, 10 or 11, **characterised** in that one or more of the devices (2-8) is/are current input devices; and in that one or more of the devices (2-8) is/are current drainage devices and where the current is flowing through the furnace wall (1) by being supplied through that or those device/-s that is/are current input devices or being discharged through that or those device/-s that is/are current discharge devices.

15 13. An arrangement according to Claim 8, 9, 10, 11 or 12, **characterised** in that those devices placed in the proximity of the furnace wall (1) volume where precision temperature control is desired are either a) provided with waists (2-4) of suitable dimensions for establishing an energy balance between the furnace wall and the current  
20 input device, or b) are current carrying and dimensioned such that the current flowing through the device in question will contribute to heat development that establishes an energy balance between the furnace wall and said current input device.

25 14. An arrangement according to any one of Claims 8-13, **characterised** in that the tube-like furnace is made of an FeCrAl material